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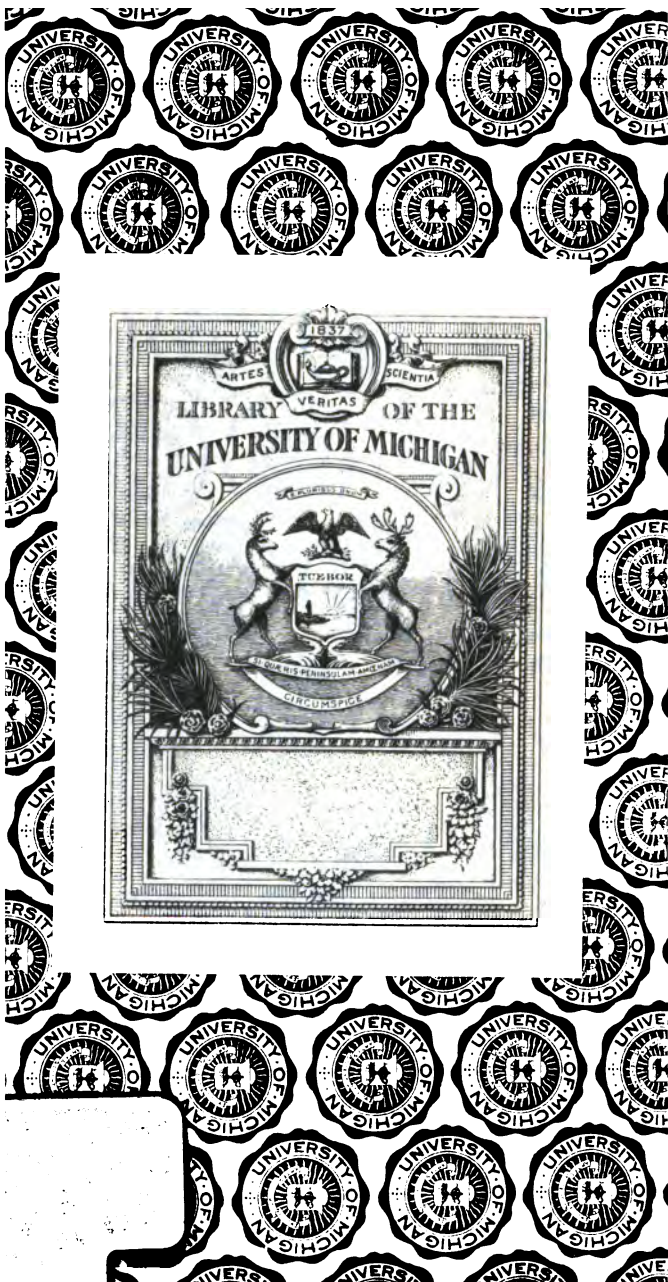
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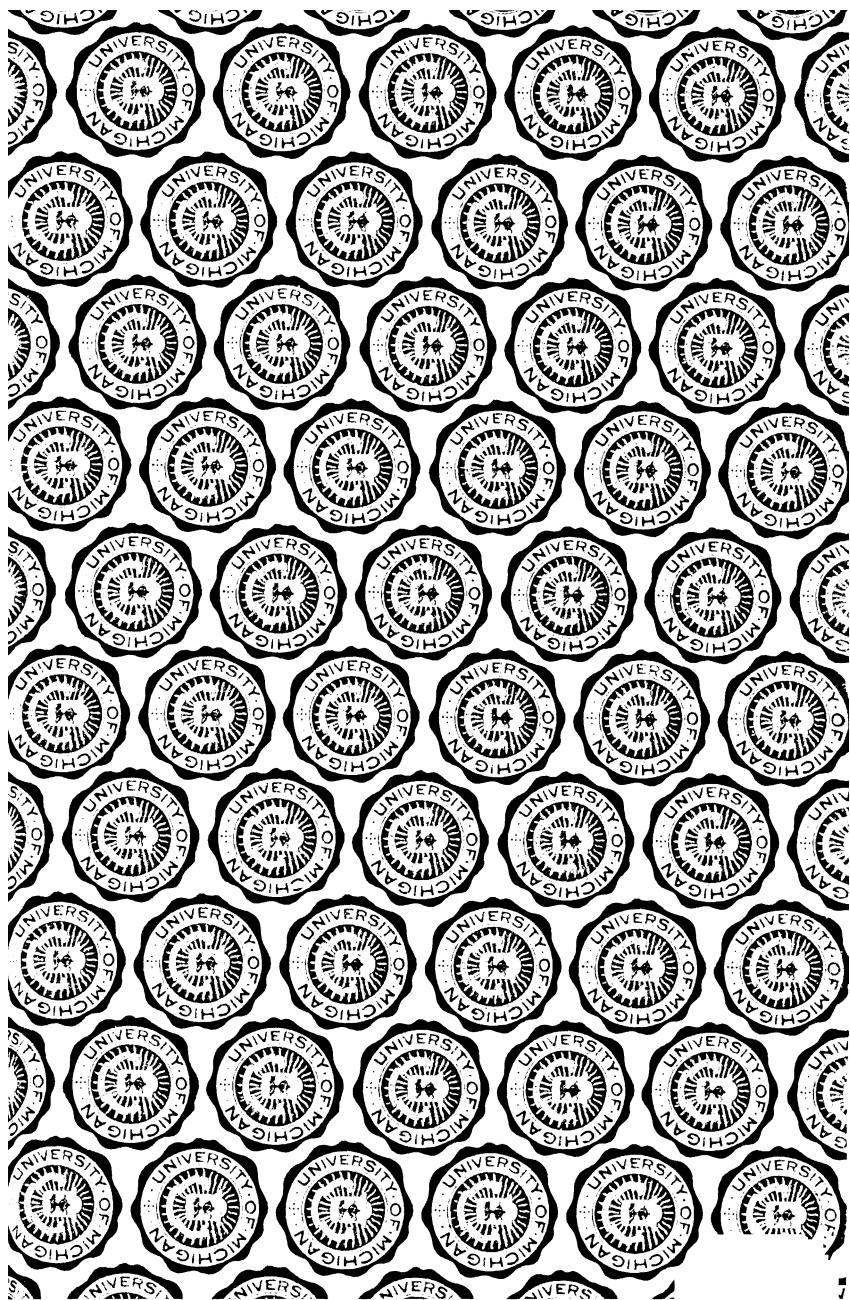
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THE
APPRECIATION OF GOLD,
AND
THE FALL IN PRICES OF
COMMODITIES.

BY
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THE APPRECIATION OF GOLD.

EVER since the effect of the discovery of gold in California and Australia was first felt in Europe, the Science of Economics has paid special attention to price fluctuations. In the sixth volume of Tooke's 'History of Prices,' Mr. Newmarch, in 1857, published a review of the prices, in the London and Manchester markets, of a considerable number of important staple-wares. This review has been subsequently continued and elaborated to a standard price-table, which up to the last years has afforded the materials for most discussions about that matter.

The investigations were at first confined to registering the fluctuations in price of each separate article, and as to the causes of those fluctuations Newmarch had, in 1857, expressed the opinion, that they could be attributed only to "supply and demand." But by degrees the propensity peculiar to statisticians, of deducing general laws from average calculations, began to force its way even into this sphere.*

* In the first table of prices in Tooke's 'History of Prices,' 55 articles were enumerated. This number was afterwards reduced to 38 and 42 in the more convenient digest of the table which Newmarch published in the Journal of the Statistical Society for 1859, '60, and '61. Subsequently the price-lists of the *Economist* have

Since the renowned economist Stanley Jevons published, in 1863, his researches on "The serious fall in the value of gold," his ingenious method of calculating "gold-depreciation" has been generally adopted by economists as a standard rule. In this work Jevons strongly maintained, that the buying power of gold had fallen 9-14%, and that the rise, that had taken place in the prices of a great many commodities, must be considered as a direct consequence of the enormous increase in the quantity of gold.* Jevons applied, in his subsequent comprehensive inquiries about the prices of 39 articles (1782-1863),† a method of proportionating prices, that was afterwards adopted in Newmarch's comparative 'Price-tables.' From the year 1863 these Tables have formed an important part of the "Commercial History and Review," published yearly in the *Economist*. These Tables now present a tolerably complete range of prices, illustrating the period 1850-85.

with few exceptions contained 47 articles. These 47 articles have been placed under 22 heads, which thus become the real factors that influence the average price. But the only difference between these figures is, that among the 47 are included several different qualities of the 22 principal articles.

* The first vague hints of a calculation of the buying power of gold are, no doubt, to be found in Newmarch's comparative tables, arranged in 1859-61 for the Journal of the Statistical Society; but the honour of a methodical and scientific evaluation of the problem belongs principally to Jevons, who was indefatigable in his laborious investigation of facts concerning this matter, and further developed his theory in that voluminous treatise, 'The Variation of Prices and the Value of Currency since 1782,' published in 1865. Jevons' ingenuity in working up statistical materials into comprehensive figures seems to have led him into a superstitious belief in the power of evidence resident in those average figures.

† For 79 so-called minor articles he also gave the average price for the years 1850-63, but these were excluded from the large table of prices.

The German Economists Soetbeer and Laspeyres have, after the same method and with no less carefulness, worked out the Hamburg price quotations for as many as 100 separate articles for the same period, 1850-85.* In other countries similar, though less complete price comparisons have been prepared. Until now, however, the attention of economists has been chiefly attracted to the very handy table of prices published by the *Economist*.

The arrangement of this "Table of Prices" is very simple. First, in table A, is given the current price per lb., ton., cwt. or gallon of each article on the 1st of January of each year. In a second table, B, are found the proportional figures or *index numbers*, which indicate the proportion between the yearly price of each article and the average price (=100) of the same article in the period 1845-50—the so-called *datum line*. For instance, the average price of coffee in 1840-50 was 44s. per cwt. (=100), and on the 1st of January, 1876, 88s. per cwt.; thus, the index number for the price of coffee for 1876 is 200. Then the proportional numbers of all articles are added up each year to form a "total index number," which for 1845-50 is 2200 (22×100), and for each succeeding year is varying according to the variations of the special index numbers. In the year 1876, for instance, the "total index number," *i.e.* the sum of the 22 index numbers, is 2711.—In order conveniently to express the price-fluctuations of all the 22 articles from year to year, it is then only necessary to divide the total index number for the year by 22. By this method

* Soetbeer, "Das Gold," in the periodical *Gegenwart*, 1856. Soetbeer, 'Beiträge zur Statistik der Preise,' Hamburg, 1858. Laspeyres, "Hamburger Waarenpreise," 1850-63, in Hildebrand's *Jahrbücher*, 1864. Soetbeer afterwards has published several editions of this price-list, last of all in his 'Materialien zur Erläuterung der Edelmetall-Verhältnisse,' 1885.

the number 123 is obtained for the year 1876, showing that the average prices for this year were 23 % higher than the average prices for 1845-50 (= 100).

The 22 articles, whose prices have been registered as an indication of price-fluctuations, are—

Copper	Cotton	Coffee	Silk	Indigo	Timber
Iron	Cotton-wool	Sugar	Flax	Leather	Meat
Lead	Cotton-yarn	Tea	Hemp	Oils	Wheat
Tin	Cotton-cloth	Tobacco	Wool	Tallow	

During the decade of 1860-71, the English price-table indicated a continuous and often very great rise in prices. At that time it was usual to point to this table in proclaiming a great depreciation, *i.e.* a decrease in the "purchasing power" of gold. Great social misfortunes were prophesied as the consequence thereof. There were, however, prominent economists, Newmarch* amongst others, who were bold enough to express a doubt, whether the rise in prices, indicated by this table, could be taken as sufficient evidence of a *general* rise, and also whether this rise was due to the increase in the supply of gold. But at that time these questions, however interesting from a theoretical point of view, could hardly be said to possess any practical importance.

At the present day, on the contrary, this same scientific

* Newmarch "On the Foreign Trade of the United Kingdom," in the Journal of the Statistical Society, 1878, pages 258-62, where very strong objections are raised against the average calculations upon which Jevons relied for his theory. It is worth noticing that Giffen, in one of his earlier articles, "The Depreciation of Gold since 1848" (1872), expressed a well-founded mistrust in the dogmatic assertions concerning the *rise* in prices and the depreciation of gold in the decade of 1860-70, which Jevons thought justified.

question bears a wholly practical aspect, since a scheme has been propounded, according to which the economic inconveniences, that are said to arise from falling prices, are to be counteracted by monetary legislation, a legislation whose purpose should be artificially to increase the "quantity of money."

Then, it must be of much practical importance carefully to test the deductions which have been drawn from the said investigations about the fluctuations of prices.

What, then, does the price list of the *Economist* teach us with regard to the fluctuations in price of the articles in question during the last decade, as compared with the previous ten years? It shows that, since 1876 prices, with a very few exceptions, have been undergoing a continuous and considerable decline. So great has been this fall, that many of the index-numbers are at this moment considerably under the average prices of 1845-50. The figures which indicate the proportions of the total index-numbers for the last ten years, as compared to the total index-number for the period 1845-50 (= 100), are as follows :—*

1876: 123	1881: 108
1877: 124	1882: 111
1878: 115	1883: 106
1879: 100	1884: 101
1880: 115	1885: 95

* It ought to be remarked here, that the proportional figures are taken from the corrected total index-numbers given in the 'Commercial History and Review for 1885,' because the same total index-numbers in some previous years (for instance in 1880) have been somewhat differently calculated. Hence a small variation arises, but this is of little importance.

and for Jan. 1st, 1886, the figure was 92! If the comparison is carried still further back, the difference becomes even more striking, as in the years 1871-75, the total index-numbers were about 131, and for the decade 1861-70 reached an average of 141. Thus, the prices for the great staple-articles of commerce have declined during the last decade 2%, 3%, and up to 5% annually, and they are now considerably lower than they were during the short period of the great gold discoveries.

There are economists who in the above series of figures have seen an indisputable mathematical evidence of a "scarcity of gold" during the years 1876-84. They have put their arguments in syllogisms, about which it is sufficient to say, that they contain as many logical faults as a syllogism can possibly contain. But it is not our intention here to enter into a purely dialectical controversy.

Other economists, while more carefully observing logical rules, still sustain the doctrine, that the fall or rise in the prices of commodities is a consequence of the decrease or increase in the supply of gold. Their arguments are running as follows:—

If the exchange value of one article, A (gold), falls or rises in comparison with several other articles (commodities, B, C, D, etc.), so that the same quantity of A purchases more or less of B, C, D, etc. than it formerly did, this may arise either from causes affecting A only, or from causes affecting each of B, C, D. Now, from the mere fact of a fall or rise in the purchasing power of gold, nothing can be deduced to explain its alteration in value. In many instances it can be distinctly seen that the B, C, or D, and not A, is the cause. As an instance, one has

only to recall to one's mind the great variations in the purchasing power of gold with regard to cotton and tobacco during the American war. But when it happens, that the exchange value of A (gold) rises or falls in comparison with the exchange values of a large number of commodities (B, C, D, E, F, G, H, etc.), then it is more probable that an alteration has taken place on the side of gold, than that there has been a simultaneous alteration of all circumstances, that affect the supply and demand of all the other articles. One cause affecting A will then suffice to explain the change in its value, instead of having to look for four, five or six concurring causes respectively affecting B, C, D, E, etc. The greater the number of articles, in comparison with which the value of gold has fallen or risen, the greater are the odds in favour of some circumstance connected with gold being the cause of the alteration. And if the value of gold rises or falls in comparison with *all* other articles of exchange, *i.e.* if the rise or fall in the prices of commodities is *general*, then there will be an overwhelming probability, that the rise in prices depends upon a lessened demand for or an increased supply of gold, and conversely that the fall in prices depends upon an increased demand for or a lessened supply of gold.

Such were the arguments which Jevons employed, when he sought to demonstrate by statistical inferences, that the rise in prices of the years 1850-63 was caused by an over-supply of gold. By the same line of argument the eminent economists Goschen, Giffen and many others are now trying to convince us, that the prices of commodities have fallen in consequence of—a scarcity in the supply of gold.

Thus: it is an *hypothesis* that the above-named writers have put forward to explain the fluctuations of prices. They take for granted that there has been a general fall in

prices; they reject every other explanation of the phenomenon as superficial and inadequate; then they proclaim a scarcity of gold as the secret and hidden power which now governs prices.

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The first condition for accepting this hypothesis as valid must be, that the scientific researches on which it is based give a fairly complete and correct idea of the price-fluctuations of all classes of commodities. I will attempt briefly to point out the objections which in this respect may be raised against the very basis of the theory in question.

It is however necessary to take as mutually conceded, that this comparison between prices must cover longer periods than single years. It is self-evident, that many causes may contribute, singly or conjointly, to changes of prices, that war, failure of crops, speculation, accidental disturbances in the proportion between production and consumption, materially determine the rise or fall of prices, and that such accidental causes are of greater importance the shorter the periods under consideration. These accidental fluctuations of prices are better eliminated when the comparisons extend over longer periods. In the present case, since we have to enquire to what extent the fluctuations of prices depend upon the changes of the quantity of gold, the extent of the periods to be examined is plainly determined by known facts. The periods of 1851-70 are in this respect clearly distinct from those of 1871-85. In the former the supply of gold rose in an unprecedented manner, and, as is believed, in a far greater ratio than the quantity of commodities; while in the latter period, though the quantity of gold somewhat increased, it did so in a degree

which was small as compared with the increase of commodities. It is therefore necessary to compare the prices of 1851-70 with those of 1871-85 in order to obtain a result which will have an important bearing on the present question. It would be misleading to compare the prices of 1881-85 or 1876-80 alone with the corresponding prices of 1871-75, since it is clear that the great increase in prices during the latter period was almost entirely due to an accidental and unnatural spirit of speculation; the rapid fall of prices which followed after such an inflation gives no clue at all to the solution of the present question.

If, with this reservation, the table of prices of the *Economist* is closely examined, it is found, that the prices in the twenty-two columns there represented during the periods in question, as compared with the same prices during the period 1845-50, which are taken as 100, give the following proportional figures:—

1851-60.	1861-70.	1871-75.	1876-80.	1881-85.
114 *	141. ₃	127. ₆	115. ₅	104. ₃

* The average figures for the period 1851-60, are, as far as can be ascertained from the price-lists of the *Economist*, somewhat incomplete, as they are based upon the current prices of six years only. This deficiency is also found in the calculations that Newmarch first published, and has not yet been amended in any of the volumes of the *Economist*; it is, however, of little consequence, as the four years omitted (1852, 1854-56) did not show any great fluctuations. Jevons' Price-Tables of 1863 (when a serious fall took place in the value of gold) include 39 articles, and show for the same period—viz., 1851-60—the proportional average number of 113. In his calculation of "The Depreciation of Gold," published six years later in the *Economist*, May, 1869, he obtains for the period 1851-60 the proportional number of 119 for 50 articles, and for the period of 1861-69 the proportional number of 122. The largely corrected Table of prices, which Stephen Bournes has prepared from the price-

These averages, as well as the yearly prices quoted above, seem at first sight to prove, that prices have considerably declined during the last ten years, not only when compared with the speculative era 1871-75, but still more in comparison with the previous period of 1861-70. What, then, is more probable, than that the increased supply of gold during the 1850-period was the principal factor in the rise, that affected all prices in the following decade: or that the declining production of gold since 1870 has caused a change in the other direction, and from 1880-85 has exercised its full influence in depressing prices? Visibly, the gold is depreciated when its production increases; again, it is appreciated when its production decreases. The *post hoc* is almost irresistibly converted into a *propter hoc*! The truth about those phenomena presents itself as plain and palpable, as any complicated economical process can be, and may be demonstrated by means of statistical average-curves or figures.

But beware of statistical averages! How treacherous

quotations of the *Economist*, shows for the period 1851-60 the proportional number of 125, and for 1861-70 the number of 133. From Soetbeer's calculations of the Hamburg price quotations I have prepared a comparative table of nearly the same articles as those which are comprised in the Price-table of the *Economist*, in which "mahogany" has been substituted for "timber," and instead of "cotton wool," which was not included in those calculations, "Baumwolle" (cotton) has been inserted twice. The proportional figures for the 22 and 18 articles respectively, after excluding the cotton wool, are nearly identical with those of the *Economist*. They are, as compared with the proportional number for the period 1847-50 = (100):—

	1851-60.	1861-70.	1871-75.	1876-80.	1881-85.
For 22 articles	113	133.,	129.,	107.,	102.,
For 18 articles	117	118	132	114	104

they may be, in all their attractive simplicity, it will be particularly easy to show in the present case.

Thus, for instance, it is only necessary to remove *one* link from the chain, in order entirely to destroy the evidence obtained from the above series of figures. The article *Cotton* plays a most important part in the *Economist* Price-tables. It represents as many as four numbers out of the 22, that is, more than a sixth part of the total. But the price of cotton and cotton goods rose 100 to 300% in consequence of the American War, and not through any superabundance of gold. If therefore we only exclude these four articles, our figures undergo the following change:—

1851-60.	1861-70.	1871-75.	1876-80.	1881-85.
114·0	125·3	128·4	119·5	107·0

If we also exclude tobacco, which rose to thrice its former value during, and in consequence of, the American War, the proportional total index-number for 1861-70 sinks to 119.

By such slight changes the enormous rise in prices, which seemed to distinguish the years 1861-70, wholly disappears. In its place the period 1861-70 is coming up as the highest point of the series. From this point the fall in prices during 1880-85 is nevertheless yet very considerable.

A closer investigation of the English price statistics shows, however, that the prices of at least four articles—tobacco, meat, indigo, and leather—indicate a tendency in an opposite direction to those of the other groups; and the question then arises: What alterations would take place in those figures, if any more of such articles, whose

prices exhibited the same tendency as those of meat, tobacco, etc., were included in the tables?

One answer to this very important question is ready at hand, if we examine the price-quotations for no less than 100 commodities, collected from Hamburg "current prices" and official price-declarations, registered and issued under the supervision of Professor Soetbeer.

These tables include almost all the articles found in the tables of the *Economist*, and many more besides, but in totally different proportions. While the English list has only 4 mineral and 4 animal products, we find in the Hamburg list 14 mineral and 22 animal products; and while the English list has but one agricultural and 7 textile products, the Hamburg list contains 20 of the former and 7 of the latter. The proportional numbers for all these 100 articles, compared with the average price of the same articles for the years 1847-50,* give now the following series of figures:—

1847-50.	1851-60.	1861-70.	1871-75.	1876-80.	1881-85.
100·0	117·7	122·6	133·8	124·1	121·7

* Up to the year 1883 these calculations have been made for every year separately, and from such data it is evident how much these proportional numbers differ from the price quotations of the English table for the period up to 1875. The proportional numbers are as follows:—

for 1876: 132	1878: 124	1880: 125	1882: 123
1877: 130	1879: 119	1881: 123	1883: 125

In his latest work: 'Materialien zur Erläuterung der wirthschaftlichen Edelmetall-verhältnisse, &c.' published in 1885, Soetbeer has compared the above prices for periods of 5 and 10 years, and he has adjoined a supplement of 14 English export articles, mostly yarns and textiles, whose prices have been extracted from the custom-house declarations.—If these are included, the series somewhat changes and gets the following form:—

100;	115 ₈ ;	123 ₄ ;	132 ₈ ;	122 ₈ ;	119 ₈ .
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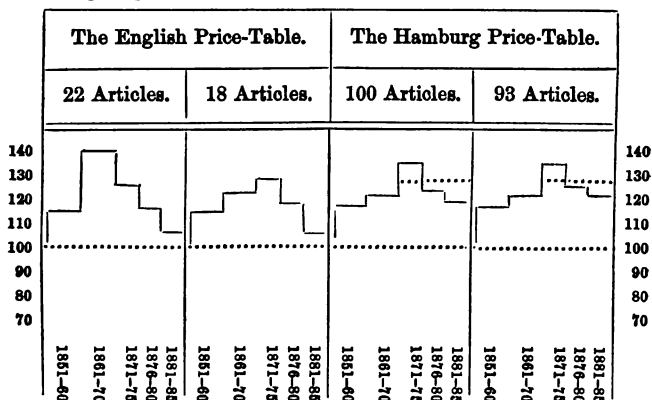
The average for 1871-85 is 126.2 and for the decade 1876-85 it is 122.

This is a yet more essential disturbance in the series of price-averages! The striking co-existence of gold-abundance and high prices, of gold-dearth and low prices, is no more, and the spell of its evidence is broken. Not only that the highest point of the series apparently coincides with the speculative mania of 1871-75, not only that the average prices for 1881-85 do not, as in the *Economist's* Price-table, sink down to the level of 1847-50, but they keep nearly as high as in the decade of 1860.*

If again we want to raise the proportional figures of the period 1881-85 above those of the decade 1860, it is only necessary to eliminate the seven textile articles. Then the price-series will appear as follows:—

100.0 118.5 122.0 135.0 125.8 123.6

* In order to bring these discrepancies between the different series of price-averages more clearly to the eye, they are here represented in following diagram :



The average for the years 1871-85 is then 128, while for 1876-85 it is 124.9.

Thus, indeed, is dressed a series of prices which might be considered to prove just the opposite of the conclusions deduced from the English table of prices. For a group of no less than 93 different articles the prices for the whole period of 1871-85, and for every one of its three *lustra*, are higher than for the period, when the abundance of gold is considered to have caused a rise in the price of commodities. Such a phenomenon cannot well be explained by a scarcity of gold or currency. It points rather to the contrary.

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This much at least is evident from the above series of figures, that the English table of prices does not afford so correct and complete a range of price-quotations as would be necessary for reliable conclusions as to the connection between prices and gold. You get very different results whenever you change, even slightly, the number of articles on which to base your averages. The series turn in an opposite direction when a larger number or new classes of commodities are included in the price-list. Which then of the two price-tables is the most reliable guide? If one is to be preferred, should it not be that deduced from the larger and more varied set of commodities? Ought not the averages obtained from the Hamburg quotations for 93-100 articles to deserve greater confidence than the figures of the English tables, containing only 18-22?

All thing considered, however, I fear that neither table affords sufficient materials to serve for an inductive evidence in the question under consideration. Neither

gives a tolerably complete information respecting that phenomenon of fluctuating prices, which economists are endeavouring to explain; neither therefore can sufficiently support the hypothesis which they have adopted for its explanation.

For what this hypothesis presupposes is, that the price-fluctuations shall be in one direction or the other general and far-reaching; but how can it be said that any of these Price-tables shows a *general* alteration in prices?

To many business men it may seem evident, that prices during the last ten years have "generally" declined. Everyone likes to consider his own particular business as the central point of economic life, and its suffering as a general misfortune. Nothing is more common than the protests of manufacturers, that the whole community is in danger, whenever the conditions of their own industry and market are changing. But an investigation such as the present demands larger views, and, the whole range of commodities in exchange duly considered, it can hardly be concealed, how extremely limited is the area, from which the materials for these statistical researches about the prices of commodities have as yet been collected.

These tables of prices are absolutely silent on points of such great importance as the prices of landed property and the standard of wages. It may be impossible to measure with any degree of statistical accuracy the importance of these objects of exchange; but if we could sum up on the one hand the total amounts yearly paid for property, rents and leases included, together with the sums paid for personal labour in wages and salaries, and on the other hand all payments for what is commonly included under the general term of commodities, we should very likely

find that the former group would require quite as much, if not more, currency than the latter. Further, the statistics relating to the value of property, to the amount of rents, to leases and wages are not yet sufficiently complete to serve as a basis for the preparation of average price-tables; but from existing calculations it is likely enough, that a comparison between the prices of landed property and the prices of labour in 1860 and prices of the same objects in 1880 would scarcely show a fall, but rather a rise in those prices, a rise in some cases very considerable.

This alone shows, that the inductive ratiocination in question is about as defective as conclusions about animals in general would be, if based solely on observations on the invertebrate animals.

But, alas, even as to the restricted group of objects of exchange, properly named commodities, our price-quotations are anything but sufficiently complete!

It appears at first sight that the Price-tables contain almost exclusively quotations for articles of food and raw material. Some partly finished goods are also represented, but the finished products of human intelligence and labour are almost entirely excluded. This one-sidedness is not due to any arbitrary selection or to any under-valuation of the importance of other objects of exchange, but simply by the impossibility of obtaining for these commodities quotations of prices, which might allow a comparison between different years or periods. For comparative purposes, it is necessary, that the quotations refer to articles which always remain, unchanged in quality; if they refer to articles the quality of which is ever varying, or which change so much from time to time, that there is a risk of comparing the prices of entirely different qualities, such

quotations are utterly useless. This difficulty can never be quite overcome, but it is far less important, when such articles as wheat, pig-iron, cotton or sugar are under consideration, than when dealing with textile goods, laces, knives, crockery, shoes, or hats. Who would venture, if he found a yard of velvet or a felt hat quoted at 5s. in 1850, and at 6s. in 1885, to say that the prices had risen, without first comparing the articles quoted? Thus another important link in the evidence vanishes, and the only commodities left, from which to draw conclusions as to the proportion between the quantity of gold and the quantity of commodities, are articles of food and raw materials.

Now, can we at least assert, that the prices of these articles of food and raw materials are quoted in sufficient number in the existing tables? No; certainly not. Any one may, by comparing those tables with any ordinary railway- or custom-house tariff, convince himself, that neither the English table with its 22 articles, nor the Hamburg table with its 100, covers all articles of food and raw materials, and that the number of those articles can be multiplied indefinitely, if including different qualities of each article. The English table enumerates 4 sorts of cotton goods;—there would be no difficulty in mentioning 10 others, each with its own fluctuating scale of prices. In the Hamburg table pig and bar-iron occur; these might be split up into many different kinds, and further multiplied by adding hoop and bolt iron, castings and iron plate of various sorts. The price of mahogany is quoted, but all the many kinds of European woods, included in the English table under the heading “timber,” are passed over without notice. Coals are quoted, but not peat and

fire-wood; vegetable oils, but not petroleum. Of the great variety of spices only pepper is included; of the large number of southern fruits only currants, raisins, plums and almonds; of the still more numerous drysaltery goods only indigo and cochineal; of manures only guano. Soda, potash, salt-petre and sulphur alone represent the large group of chemicals, and so on all through the list of raw materials and food products. Just as the Hamburg table with its 100 articles gave a view of price fluctuations, different from that of the English table with its 22 articles, so it is not only possible, but probable, that a new and very altered scale of prices would result, if it were possible to register the prices of another hundred or two of similar articles.

What reliance can be put on the trustworthiness of general deductions, based upon such statistical inquiries? It may be safely asserted, that no theory or hypothesis in any of the experimental sciences would be considered sound, if they rested on observations so defective, so dependent on accidental and arbitrary choice of objects for observation.

Bearing in mind the aforesaid condition for the validity of the hypothesis, namely, that the price-fluctuations should be general in one direction or the other, or at least refer to the greater number of objects of exchange, we might thus quietly conclude that, for want of links in the chain of evidence, the hypothesis in question is *unprovable*.

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To proceed further: those price-quotations, gathered, as they are, from a narrowly limited field of observation, do they at least, for this restricted class of commodities, denote any general tendency to a fall or to a rise in prices, common to all, or even to a majority of the same commodities? By no means! On the contrary, while they show that many

articles have gone down in price during the last fifteen years, the observations exhibit, just as clearly, that a great many other commodities have risen in price in the same period.

The English table of prices, with its series of figures, apparently showing a general and continuous fall, includes, as is said above, at least four articles, or nearly a fifth of the whole number, the prices of which, compared with those of 1860, have not fallen, but risen; and it is only through the average calculation that the rise of these few articles has been swallowed up by the fall of the others.

Still more apparent, in the Hamburg price-table, is this discrepancy between the special price-series, which are melted together in the general price-series. Amongst its 100 different articles there are 22, which resemble one another,* in continually rising in price during the whole period of 35 years. The scale of average prices of these articles is as follows:—

100·0	128·0	143·4	170·2	178·5	191·5
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But in the same table there are 20 other articles† which have simultaneously and uninterruptedly fallen. The proportional numbers for these articles are as follows:—

100·0	95·5	85·5	87·9	78·8	68·9
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To which of these two groups ought now the greatest importance to be attached, taking into consideration either the changes in the price of the articles, or the connection between such changes and the relative proportion between

* These articles are malt, buckwheat, hops, veal, mutton, bacon, milk, butter, bristles, buffalo-horn, herrings, dried cod-fish, almonds, French wine, champagne, cocoa, pepper, rum, cane for chairs, ivory, gum, and gutta-percha.

† Wheat, wheaten bread, rape-oil, linseed oil, olive oil, pimento, rice, sago, cochineal, logwood, quicksilver, salt, chalk, silk, wool, potash, pearl-ash, soda, composite candles, and wax.

gold and goods? Are we to believe in a general and heavy rise in prices, as evidenced by the articles bacon, butter, &c., or in a general and great fall in prices as shown by wheat, salt, &c.? Does the fall in price of the last group prove that gold and mediums of exchange have become scarcer, or ought the rise of the first group lead us to infer that gold has been abundant during the whole period? Does the first list present stronger inductive evidence than the second, or can it be suggested that the articles in the latter have been more arbitrarily chosen than in the former? By no means. Both groups are in this respect similar. Nor is their numerical difference sufficiently great to justify us in maintaining, that it is more probable that the supply of gold has increased, than that it has diminished.

The remaining 58 articles of the Hamburg Price-table cannot be, with regard to their periodical price-fluctuations so easily divided into distinct groups. By their help it would be possible, by varying the combinations, to trace as many different price-curves as you like; just as the pieces of glass in a kaleidoscope form ever-changing figures by the slightest movements of the hand. But by placing on the one side those articles which have shown varying tendencies to rise, and on the other side those whose prices have mainly been sinking, the 100 articles may be very nearly equally divided. The average figures of prices for the first-named 51 articles give the following rising series:—

100·0	125·3	130·3	147·1	143·7	146·4
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The following scale again represents the averages of the remaining 49 articles, and shows a more decided downward tendency, at least during the last fifteen years:—

100·0	109·7	114·6	121·7	103·7	96·7
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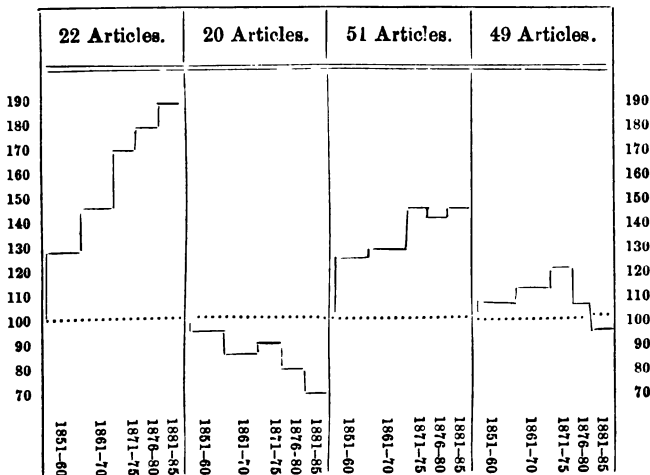
In the first of these groups are included 20 different agricultural products, 22 animal products, 7 fruits and wines, and, among colonial articles, cocoa and ivory. In the latter are included 17 colonial articles, 14 minerals, 7 textile products, and 11 chemicals, manures, etc.

Certainly, you cannot say, which of the two groups plays the most important part in the markets.*

Thus we have again two contradicting evidences, and no means of judging between them. As to the inferences to draw from these opposite price-series, it is equally probable, that the buying power of gold has increased, owing to a decrease in the mediums of exchange, as that it has decreased, owing to a somewhat mysterious increase in the

* In order to bring the four respective series of prices more clearly to the eye, they are here represented in the following diagram:—

PRICES ACCORDING TO THE HAMBURG PRICE-TABLE.



mediums of exchange. Or, to put it more explicitly, the hypothesis of a disturbance in the harmonious proportion between commodities and gold, which has been used as an explanation of the recent change in prices, does not sufficiently explain these phenomena, in so far as they are reliably known to us. This hypothesis, on the contrary, is incompatible with the increase in price of a great many commodities, which is indisputably proved by this table. In fine, the hypothesis is *insufficient*.

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It is evident that you could not proceed a step further, if, in the above manner, the different articles were to be ranged in separate groups somewhat in accordance with the direction of their respective price-curves. But in the calculations of probability, through which the economists have traced the cause of price-fluctuations, such a division of the commodities after their tendency to rise or to fall in prices has not been thought expedient. Nay, all the registered commodities, both those with rising and those with falling prices, have been huddled together; and from the averages taken of those prices, going in all directions, are formed the great average price-curves which then are presented as standard-measures of—the quantity of currency.

Opinions have differed as to which average or medium, the arithmetical, the geometrical, or the “harmonical,” ought to be employed in the dressing of Price-tables. Doubtless the two latter are theoretically more correct, though the former, being more convenient, is generally used. But it is, I fear, immaterial, both which method is applied, and what results it may lead to, because, with

the materials now at our disposal, the whole calculation is no better than a useless plaything, on the whole void of scientific value. I will try in a few words to illustrate the uncertainty and fallacy of those evidences and probabilities, based upon general averages from discrepant price-series.

If from one year or decade to another the price of meat rose 20% (100:120), while the price of tea fell 25% (100:75), how could it then be considered as common sense to argue, that both, taken together, had fallen (200:195), with $2\frac{1}{2}\%$?

The only explanation of such a remarkable proposition would be, of course, that falling and rising prices are identical with something that in other words is called increase or decrease in the buying power of gold, and consequently, that it is the buying power of gold, as compared with the two commodities, which is measured by the average calculation.

Such a method of measuring the buying power of gold would nevertheless hardly be accepted by any one, who for 100 lbs. of meat uses only 1 lb. of tea. He would soon find, that if a pound of meat rose from 10*d.* to 1*s.*, and a pound of tea fell from 4*s.* to 3*s.*, the fall in price of the latter would be of little consequence to him or to the buying power of his sovereign, as compared to the rise in price of the former. While in the former period the two quantities of commodities would have cost him £4 3*s.* 4*d.* + 4*s.*, they will now cost not $2\frac{1}{2}\%$ less, or £4 5*s.* 1*d.*, but £5 + 3*s.* or 18% more. He will not be able to obtain more meat and tea for his £3 7*s.* 4*d.*, but, on the contrary, less. For him, the buying power of gold has not increased by $2\frac{1}{2}\%$, but fallen by $14\frac{2}{3}\%$.

Thus, in striking an average of the buying power of

gold, it is no doubt an error, and a serious one, to omit from the calculation the "quantities in exchange" of the various commodities. If, when dividing the total sum of the special price-figures by the number of the articles, you take each article as an entity, you will therewith wrongly admit each one to have the same influence on the final result, irrespective of its quantitative importance in the market. The articles coal and meat absorb far more currency than the articles buffalo-horn and cochineal. It is therefore quite unreasonable, in striking the average, to allow the rise in price of buffalo-horn to play the same part as the fall in price of coals, or to let the decreased buying-power of gold, compared to meat, be balanced by its increase in comparison with cochineal, which latter requires scarcely one ten-thousandth part of the amount of currency absorbed by the former.

As long as the same value is given to every article in the average calculation, there is large room for any arbitrary combinations, and the appearance of the price-curves will depend upon the merest accidents.

But if, in calculating the buying power of gold, it is necessary to measure the different articles in regard to their relative importance as objects of exchange, it is, for such an evaluation of their relative market-quantities, in no wise sufficient to compare the import-lists of some particular port or country. For in a comparison of this description such articles as buffalo-horn, pepper, coffee and cocoa, the whole consumption of which is registered in the import list, would get an undue importance in comparison with such articles as meat, timber, corn and iron, the greater quantity of which is produced in the country itself, and nowhere visible in the import list. Thus, for a sufficient valuation of the quantities in exchange of

each commodity, a statistical research would be requested, which it has been hitherto found impossible to produce, and which probably will never be obtained.*

Again, even if the incredible should happen, if, through the statistics of the future, the buying power of gold could be accurately measured, and if it could be thus shown, by balancing falling and rising prices, that one or other had a decided preponderance, *i.e.* that the buying power of gold had really increased or decreased compared with its buying power in a previous period; what would thereby be gained for an inference as to the probable cause of the change?

If, for instance, the buying power of gold increases, compared to wheat, by 30%, when the fall in price of this commodity is evidently caused by over-production, and if at the same time the buying power of gold decreases 20% compared to wine, when the price of this commodity has risen owing to the ravages of the Phylloxera, would it then be allowed to state, not only that the buying power of gold compared to both commodities has risen "in average" 5%, but also that this average-appreciation of gold must be attributed to a new cause of the two price-fluctuations

* As far as I know, the mathematician Drobisch, was the first writer who has paid sufficient attention to this highly important factor in the calculation of the buying power of gold. He published his views in an article, "Über Mittelgrossen und die Anwendbarkeit derselben auf die Berechnung des Steigens und Sinkens des Geldwerths," in 1871. It is true that Laspeyres has since published in an article, "Die Berechnung der mittleren Waarenpreissteigerung," in Hildebrand's Jahrbucher, 1871, a calculation of averages, in which he has taken the important quantities of the articles into account; but he himself acknowledges that such a calculation of the imports alone cannot give the real exchange quantity of every article.

—i.e., to a supposed scarcity in the supply of gold? Certainly not; such an assertion is palpably absurd! Or would such an explanation be more reasonable, if the number of articles, from which the average of falling and rising prices is taken, amounted to one or several hundred? Can the adding together of a hundred price-fluctuations, each produced by its own cause, magically conjure up a new “average cause” of a totally different species? Certainly not!

No; there exists only one condition, under which the aforesaid average price-series could afford a reliable inference as to the connection between changes in prices and changes in the supply of gold; and this condition is that the price-fluctuations of the greater number of commodities could not be led home to circumstances affecting demand and supply of the same commodities.

No such thing can be said about the price-fluctuations which we witness at present. There is scarcely any reduction in prices, of which producers now complain, that cannot be attributed to those purely natural and evident causes which at any time would have produced the same effect. There is no need, when seeking to explain the falling price of Indian corn, wheat, rice, cotton, sugar, wool and quicksilver, for any other reason than the undeniable fact that new places of production have been developed, that the new producers have been able to offer their goods at lower prices, and that the consumption of these articles as yet has been unable to overtake the supply. Nor is it necessary, in order to understand why guano, cochineal, and tallow have fallen so heavily in price, to refer to any other circumstances, than that new manures,

new dyes and new lubricants have been discovered, which have gradually supplanted the articles and deprived their producers of the monopoly for the supply of the market which they formerly possessed. Again, it is enough, when we wish to explain the sudden rise of iron in 1871-75, and its equally great and lasting fall after 1876, to refer to the unprecedented demand for every kind of iron goods during the former period, and the consequently greatly increased extension in all branches of mining and iron industry, by which a point has now been reached, where every slight increase in the demand is immediately met by an increased supply.

It is easy in this way to account for the recent fall in prices, and everywhere a natural explanation may be found, if we remember the old and well-known rule that prices rise, when there are two buyers to one seller, and fall, when there are two sellers to one buyer. Either the production and offers of sale have increased faster than consumption and demand have grown, or the consumption and demand have decreased, while the supply has remained stationary. In every instance, where the contrary has been the case, prices have risen; French wines, ivory, arrack, and rum are sufficient examples of the effect of a decreasing production, and the prices of animal food rise because the production is as yet unable to keep pace with the increasing consumption. In all these cases the fall in prices depends upon circumstances which have no immediate connection with a larger or smaller supply of the medium of exchange.

But, it is asked, how can you then explain the fact, that the fall in prices, which is established by these researches, even though not general, has affected so many groups of articles at the same time and has continued for ten

years or more? Is it likely to be merely an accident, that wheat and rye, lead and iron, salt and lime, wool and dyes, cotton and coal have all fallen in price at the same time? As the general intensity of the production cannot be lead home to any simultaneous whim in the minds of producers, there must exist some deeper hidden cause, some cause that affects the whole market at once. And how can you explain the long duration of these low prices and their continual fall? Under ordinary economic conditions, the over-production, which is now spoken of, ought very soon to be remedied by capital and labour shifting from less to more lucrative trades, or by the low prices widening the sphere of consumers, and so bringing the demand up to the supply.

The reply to these questions is close at hand; it has often been given but will bear repetition. The causes of the fall in prices are as numerous as the articles themselves and as different and changeable as the conditions of time and place, under which the commodities are produced, offered for sale and inquired for. It is possible, however, to compare, collect and group these causes according to certain affinities; and the state of trade, which at present is vexing a large number of producers all over the world, invites by itself to such a comparison. There is doubtless a far-reaching cause for the extensive fall in prices; or rather there is something similar and common in the causes, which have simultaneously determined the fall in price of a number of articles. Wheat has become cheaper, because the crops of Illinois, Bengal and Victoria compete, aided by new conditions of transport, with the crops of Sussex, Normandy and Podolia. Petroleum has become cheaper, because it is as easily brought from Baku as from Pennsylvania. Cotton,

rice, wool, salt, copper and lead have declined in price, because the Suez Canal shortened the road to India, because the Ocean routes have become less costly, because new railways and reduced freights diminish the distance between places of production and consumption far remote from one another, and lastly in consequence of improved methods of cultivation and the development of mining industry. The prices of other articles have been influenced by the altered character of trade, direct trade having displaced speculative consignment, the greater "middle men" having given way to what we may almost call an international retail trade, prices therefore being no longer dependent upon a few large depots of goods, accumulated at certain central markets of Europe.

What is common and similar in all this, is—the development of communications. This development has never so revolutionised the trade of the whole world as in the years 1870–85, since Africa has been cut through by the Suez Canal, and the American continent traversed by several large railways; since the Alps are penetrated by the great tunnels and the fertile land of India intersected by 16,000 kilometres of new railways; since the total tonnage of steamers largely exceeds that of sailing vessels; since the railway rates in America and the steamships' freights from America have been reduced 50 to 70%, and have reached a point which makes it possible for the Illinois farmers to compete in the Liverpool Docks with English wheat growers. Other factors have simultaneously acted in the same direction: technical improvements in all branches of manufacture, the steady development of the use of steam and electricity for the production of goods, all tend toward the same reduction in the cost of production and the same increase in the means of production.

Nothing however could have had such a wide influence as this change in the conditions of transport, which has all but annulled the distances between the continents, and thereby increased productive powers available for Western civilisation in a hitherto incredible degree.

It is quite natural that such a revolution in the conditions of the trade, of the production and the consumption of the world should have a far-reaching and lasting effect. It could not take place without a reduction in the exchange value of goods produced, and without the owners of the means of production, of land, buildings and machinery suffering a more or less important reduction in their accustomed returns, and finally without bringing many factories to a temporary standstill.

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That hypothesis therefore, which attempts to attribute the present price-fluctuations to a change in the proportion between the respective quantities of gold and commodities, is not only *unprovable*, because it lacks the support of sufficient induction; it is also *insufficient*, because it cannot simultaneously explain both the falling and the rising prices of commodities; it is finally also *superfluous*, as there are other more complete and more conclusive explanations for a widespread fall in price. Thereby collapses the whole edifice of price-theories, which with so much trouble have been raised upon a frail foundation.